FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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INDEX AND TITLE PAGE FOR VOL. XII.

The 8-page Index for Vol. XII of "FLIGHT" (January to December, 1920) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1/- per copy, post free.

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

April 12 ...	Wilbur Wright Memorial Lecture, "Scientific Methods in Aeronautics," by Maj. G. I. Taylor, before R.Aë.S.
April 13–20	Monaco Seaplane Meeting
April 20–22	Aero Club of France Grand Prix. 3rd stage
May ...	Seaplane Contests on Lake Garde, Italy
May 15 ...	Entries Close for Schneider Cup
June 10 ...	Race, Lugo–Trieste–Triente–Lugo
July 16 ...	Aerial Derby
July 29–31	Jacques Schneider Cup, Venice
Sept. 4–11	Brescia Races
Sept. 5 ...	Pulitzer Trophy, Detroit, U.S.A.
Sept. ...	Gordon Bennett Balloon Race
Sept. 25–Oct. 2	Aero Exhibition, Prague
Nov. ...	Paris Aero Salon

EDITORIAL COMMENT

THE period of uncertainty with regard to the future of the Air Ministry as a separate Department of State is, we are exceedingly pleased to know, at an end for the time being. It has now been again constituted as a completely separate and distinct Ministry, with its own Secretary of State at its head, and is no longer a mere appanage of the War Office. There was absolutely nothing to be said in favour of the arrangement by which the Secretary for War was at the same time head of the Air Ministry, while there was every conceivable argument to be adduced against it. The whole controversial ground has been traversed so often that we need not enter into discussion of the *pros* and *cons* now. It is sufficient to say that we are unfeignedly thankful the Cabinet has seen fit to repent of what we always conceived to be a very serious error of judgment, late though that repentance may appear to be. Under a less capable Minister than Mr. Churchill has shown himself, and one who had the interests of aviation less at heart than he, irreparable harm might have been done during the tenure of office of a dually-responsible Secretary of State. As a matter of fact, harm has been done, and a great deal of it, because even Mr. Churchill's capacity was not equal to fulfilling both rôles adequately. One Department had to suffer, and unfortunately, from the point of view of those devoted to aviation, it has been the work of the Air Ministry which has gone to the wall. However, that is a matter of past history now, and we may be allowed to express the hope that, under the new constitution, matters will progress with more smoothness and satisfaction all round than they have done since the end of the War.

The New Régime at the Air Ministry

The appointment of Capt. Guest to be Secretary of State for Air has come as a complete surprise. Among the various names which have been discussed as "possibles," his has (even in spite of his many "I have been asked to reply to this question" upon Air matters) never been coupled at all. We certainly mean no discourtesy to the new Minister when we say that we do not understand the appointment

at all and are at a complete loss to find a reason for his sudden elevation to Cabinet rank in the capacity to which he has been called. Still, we do not question the Prime Minister's choice, the more so since it would be grossly unfair to Capt. Guest to criticise his appointment before he has had a chance to show his capacity as head of the Air Ministry. He has had a quiet Parliamentary life, having represented East Dorset as a Liberal since 1911. During the War he served in the original Expeditionary Force in France during the first part of the operations, and then, at the end of 1915, went to East Africa on the staff of Sir H. Smith-Dorrien. Invalided home in 1917, he returned to Parliament and became Patronage Secretary to the Treasury. Since Mr. Churchill went to the East, he has replied in the House to a number of questions affecting Air Ministry policy, but apart from that it does not emerge that he has had any close contact with aerial policy.

Captain Guest has a wonderful chance, if he will take it. The question we shall require to have answered, not in words but in acts, is : Does the new Minister realise the extreme, the vital importance, to the country and the Empire of air power and the only safe and economic methods by which we can assure ourselves of the necessary powers of expansion in time of need ? If he does, and is certain enough of himself to pursue his task to its ultimate objective, it is in his power to make a wonderful success of his office. If he does not and cannot, then the choice will be held to be a bad one, and the sooner a change is made the better. We say this in no spirit of criticism, which we feel would be out of place at the outset. But aviation, particularly on the civil side of the movement, is in such a critical condition now that there is nothing to be gained and much to be lost by mincing matters. In a word, we want a strong, able Air Minister who knows what is needed and will insist upon getting it. Have we got such a Minister in Capt. Guest ? We do not know, and time only can answer the question.

* * *

French Air Aims

For some reason or other, which we do not attempt to explain, a completely different atmosphere seems to prevail in France in matters affecting aviation to that existing here. There is more prevision, more certainty, in the manner in which the subject is approached than there is in this country. Last week the Budget clauses including the votes for aviation were discussed by the Senate, and were passed as they stood, almost without debate. As a matter of fact, the reports of the discussion indicate that the only criticisms which the Government had to meet were directed against what some members of the Assembly appeared to think indicated a less amount of progress than should have been made.

It is abundantly plain that France does not intend to be left behind in the race for supremacy in the air either by her Allies or her late enemies. The whole tone of the discussion showed that, and therein differed from the atmosphere of bored apathy with which our own House of Commons as a whole appears to regard a subject which is literally above the heads of the majority of the members. As to what France is doing and intends to do, it was stated that the connections with London and Brussels are shortly to be augmented by a Paris-Amsterdam service, while the Paris-Prague line is to be continued to Warsaw to enable travellers to reach the Polish capital in a single day. France, remarked the Under-Secretary for Aeronautics, is ahead of other countries, and her technical efforts are being vigorously pursued.

Today we have to admit with a certain amount of shame that this fairly represents the position. France *is* ahead, and for that she has to thank the British Government, which has played fast and loose with aviation ever since the end of the War. We finished in 1918 with a lead in aerial matters, in design, construction, and *personnel*, both technical and operative —a lead over all the rest of the nations which can only be said to have been almost overwhelming. That has been dissipated into thin air. Most of our designing staffs have been distributed to the four winds, and have been compelled to find occupation in other walks of life and industry. Our factories have either been closed down altogether or have, for the most part, been turned over to the production of things other than aircraft. Our best aviators have had to return to more prosaic trades than flying. A few have entered the service of foreign Governments, and are busy now in the creation of aerial interests for countries which may one day turn the knowledge thus inculcated against ourselves. And all because a wobbly Government has not been able to make up its mind one way or the other ! We certainly congratulate our Ally on her progress in the air, and admire the expansive outlook which her statesmen have adopted, but, without a suspicion of jealousy, we still grudge her the lead she has wrested from us. We have nobody but ourselves to blame for it, and France would be foolish to be deterred from her forward policy merely because we chose to fritter away our chances.

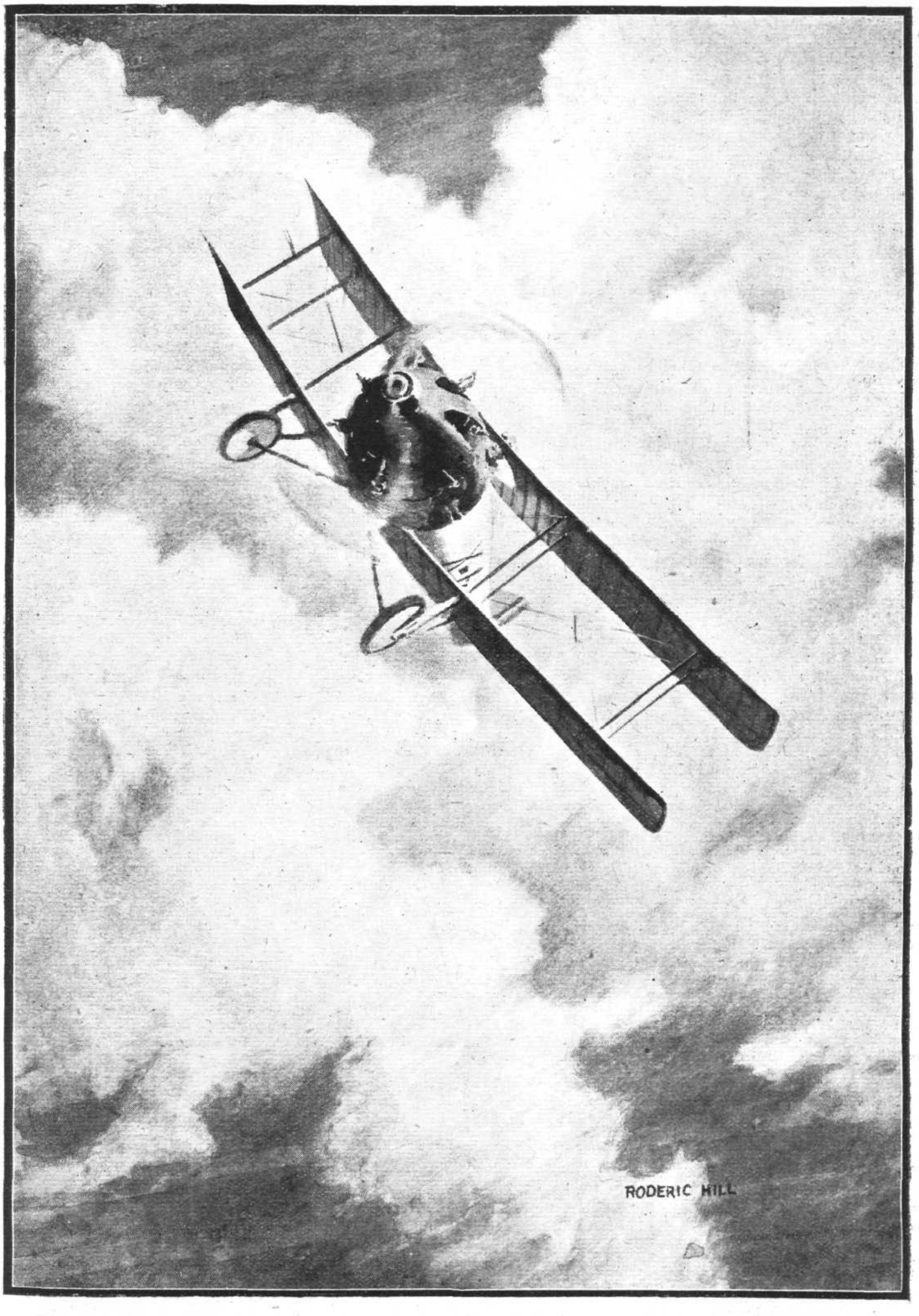
* * *

Easter Air Traffic

The Easter holidays saw quite a boom in cross-Channel air traffic. All the services were greatly increased, and even then were barely capable of coping with the rush to secure seats for the trip to Paris or Brussels. Not only this, but we are told that since the fares were reduced and the British services re-started, ordinary traffic has increased three-fold, and the demand still is for more facilities. This is an exceedingly healthy sign, and augurs very well for existing services and those which are still be come.

We have always expressed the view that what is wanted more than anything else to popularise flying is the better education of the travelling public in its facility and safety. Once confidence is secured the rest is easy. Obviously, if the traveller is assured that he actually will be conveyed from point to point in absolute safety—by that we mean with the ordinary safety of train and steamer transport—in fewer hours and for less money than alternative methods of travel entail, the average person will take advantage of what is offered him. We are now beginning to see the results of the speed and certainty with which the cross-Channel services have been conducted. The public realises that aerial travel is as safe and certain as any other, while it possesses the added merit of being infinitely faster and actually less costly in the case of existing services than train and steamer. We are getting on famously in this one direction, but there still remains a long road to travel before aviation can come into its own. There is no truer saying than the one which tells us that one swallow does not make a summer. Nor does one successful service make an aviation industry.

Now that so much progress is being made, it is more



A Climbing Turn on the Bat Bantam.—(*From the Original Drawing by Roderic Hill.*)

than ever essential that there should be a definite State policy towards aviation, and that the promised aid should be extended without delay in order that existing services may be increased, as France intends to increase her services, and new ones created. By the adoption of this policy the day will be hastened when civil aviation will be able to stand on its own feet and to back up the Service side with the necessary material and *personnel* for expansion in time of need.

Incidentally, while on the subject of services new and old, we would refer to that new service which is to start this week—last Monday was the day fixed for the opening—between London and Amsterdam and Rotterdam. The machines which are being used are, as was long since recorded in FLIGHT, Dutch-built, equipped with British engines and flown by British pilots.

* * *

Sport in the Air

Under the auspices of the Royal Aero Club, sport in the air is to take on a fresh lease of life during the ensuing summer. Of events at home, the one which possibly presents the more immediate interest is the Aerial Derby, which is to be flown as usual over a circular course round London on July 16th. It is quite on the cards, too, that there will be an aerial race between teams of four machines each, representing the rival Universities of Oxford and Cambridge. This event, however, has not been definitely arranged as yet, the permission of the two Chancellors being necessary. This has not been given yet, and it is to be hoped that there will not be any particular difficulties raised by the authorities concerned.

Then, there will be another R.A.F. "Pageant" at Hendon, probably in July; while there is to be a race round the Isle of Wight for amphibians and seaplanes during Cowes Regatta Week. The most important event from the international point of view is the race for the Schneider International Cup for seaplanes, which will take place at Venice on July 30–31. Last year, for reasons which we will not trouble to discuss, there were no British machines entered for this race. In fact, the Italians had it all to themselves. We sincerely trust there will not be a repetition of the policy of standing out again this year, and that British manufacturers of seaplanes will endeavour to bring back the Cup to these shores, backed as they will be by the Club.

We are very strongly of opinion that there is no better propaganda for aviation than these sporting events, which bring home to the general public, in a manner that the printed word cannot do, how absolutely safe and certain flying has become. They are educative in the very best sense of the word, and we could wish it were possible to hold more events of the character of the Aerial Derby, which is witnessed year by year literally by millions of people. What the value to aviation is of so striking a demonstration of speed and safety no one can say. It is simply incalculable.

Not only do these sporting events go a long way toward popularising the idea of aerial travel, but they have a distinctly good effect on the evolution of the machine. We are at a stage of development now when, having got over all the infantile troubles to which early aircraft were prone, design is approaching adolescence. Some may hold that it has already arrived at the adult stage, but we do not agree. There is still an enormous amount to be learned, and it can best be learned in the hard school of open competition in the air. On every ground, therefore, we are delighted at the promise of a season prolific of aerial sporting events, and congratulate the Royal Aero Club on the success which has attended its efforts to compile a worthy programme of sport.

U.S. ASK FOR "PURSUIT MACHINE" TENDERS

IN connection with the appropriation for aviation in the U.S. Army bill, tenders have been invited to supply a number of 300 h.p. Wright-engined Thomas-Morse "M.B.3" pursuit machines, these being, it is stated, considered the best type from its performance as runner-up in the Pulitzer Trophy Race, when over a measured course it established an average speed of 170¼ m.p.h. These tenders were asked for in lots of 50, 100, 150 and 200, with necessary spares in each case, and the bids opened on February 21. The results are interesting. Fourteen constructors submitted bids on 50 machines, and nine of these constructors put in for all four quantities. The tenders show a total average bid of $639,574·24 for 50 machines with spares, while the average total bid for 200 machines is $1,945,263·23. For the lots of 50 the lowest bid was $432,500, by the Waterman Aircraft Mfg. Co., Venice, Cal., and the highest $999,351·25, by the Wittemann-Lewis Aircraft Co., Hasbrouck Heights, N.J.* The time for delivery varied from 6 months to 13 months. In the 200 lot tender the lowest was $1,448,845·97 by the Boeing Airplane Co., Seattle, Wash., and the highest $2,760,000 by G. Elias and Bro., Buffalo, N.Y., deliveries varying from eight to nineteen months.

Various small discounts were offered for payment within ten to thirty days.

The other firms (those marked with an * tendered for the 50 lot only) tendering were:—Aeromarine Plane and Motor Co., Keyport, N.J.; *Bethlehem Aircraft Corp., Bethlehem, Pa.; Curtiss Aeroplane and Motor Corp., Garden City, N.Y.; Dayton Wright Co., Dayton, Ohio; Eberhart Steel Products Co., Buffalo, N.Y.; *Gallaudet Aircraft Corp., East Greenwich, R.I.; L.W.F. Engineering Corp., College Point, N.Y.; *Longren Aircraft Corp., Topeka, Kan.; *Lawrence Sperry Aircraft Co., Farmingdale, N.Y.; Thomas-Morse Aircraft Corp., Ithaca, N.Y.

An Air Minister Again

IN the Cabinet re-shuffle announced last week-end the anomaly of a dual-headed War and Air Minister was at last remedied in the appointment of Capt. the Rt. Hon. F. E. Guest, C.B.E., D.S.O., M.P., Chevalier Legion of Honour, to be Secretary of State for Air. Patronage Secretary to the Treasury since 1917 and Liberal M.P. for East Dorset since 1911, Capt. Guest is 45, and has served in three wars—on the White Nile in 1900, in South Africa 1901-2, and in the European War 1914-16, and subsequenrly in East Africa 1916-17.

The French "Concours Militaire"

THE three-engined Farman Goliath is reported to have passed the elimination trials for the *Concours Militaire*, which require an altitude of 4,500 ms. (14,800 ft.) to be reached, and at that altitude flying at a speed of at least 110 kms. (68 miles) per hour; flying at 3,000 ms. (9,850 ft.) at a speed of 160 km. (99 miles) per hour, and flying level on two out of the three engines. Having thus qualified, the machine then entered on the final test of flying 4,500 kms. in three days. During the elimination tests the machine was piloted by d'Or, but in the duration test was piloted by M. Gonin, who was accompanied by his mechanic, Robin, and by the official observer, Lieut. Cousin. On April 1 Gonin completed his first stage by flying from Paris to Orleans and thence to St. Inglevert, a distance of 500 kms., in 3 hours 51 minutes. On April 3 he was reported to have flown from Metz to Toussus-le-Noble, the Farman aerodrome, having, apparently, flown from St. Inglevert to Metz on April 2. From these flights it would not appear that the required stipulation has been so far carried through.

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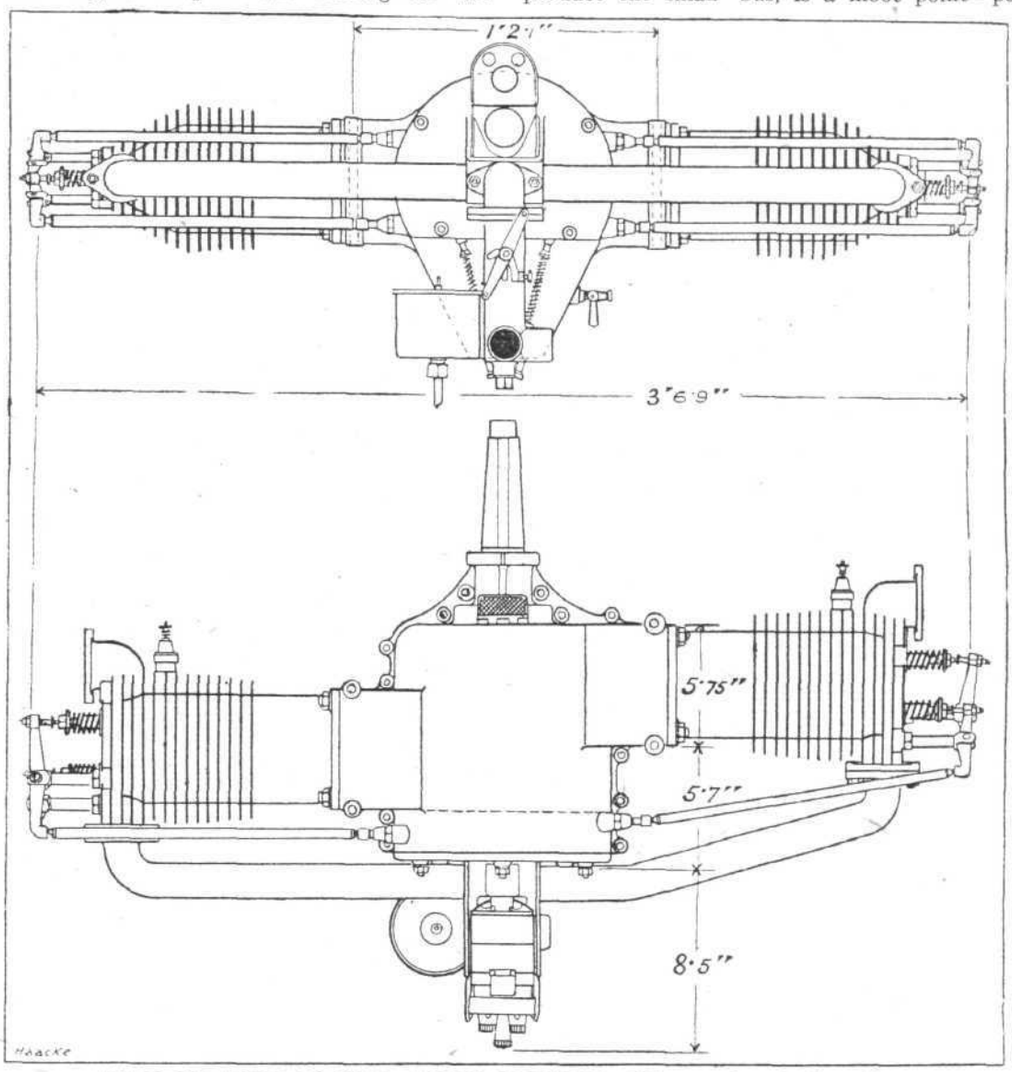
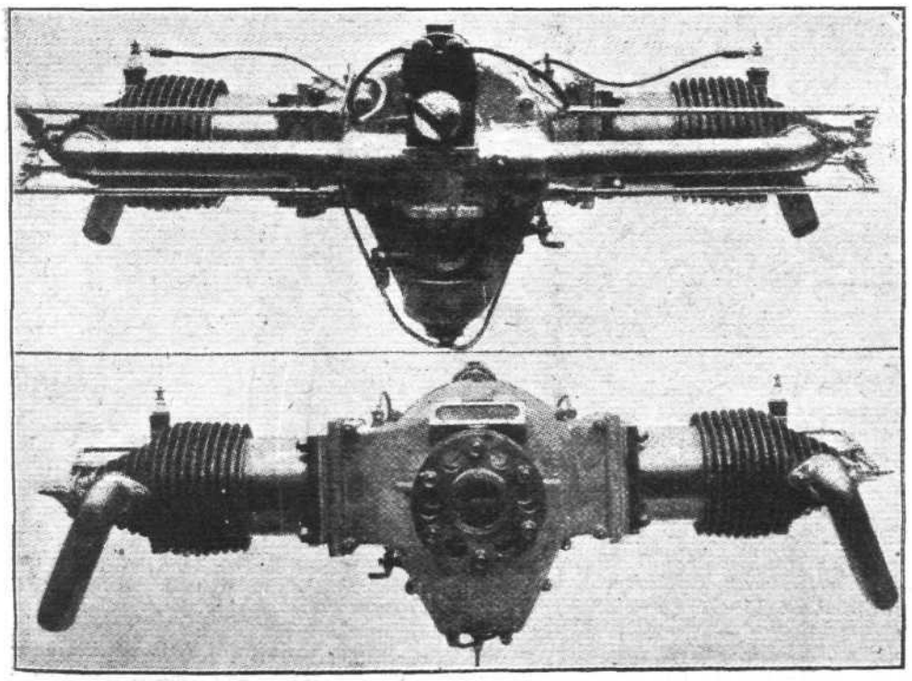
THE HAACKE 30 H.P. AERO ENGINE

AERO engines of really low horse-power—30 and under—are few and far between, as are aeroplanes fitted with such engines. Whether engine designers are waiting for the demand for these engines from the aeroplane designer, or whether the latter are waiting for the supply before they produce the small 'bus, is a moot point—perhaps, as the



THE HAACKE 30 H.P. AERO ENGINE: Plan and end elevation

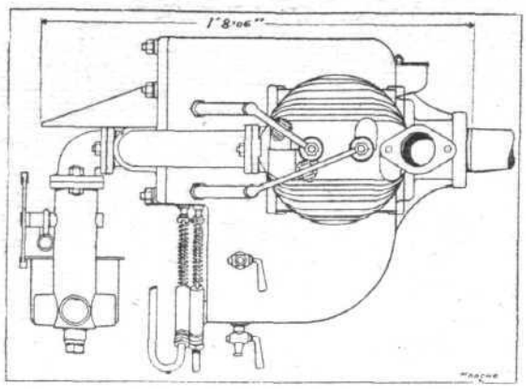


The Haacke 30 h.p. Aero Engine: Rear and front views.

schoolboy said, "the answer is in the affirmative." Of one thing, however, we are certain, and that is, the combination of the small engine and aeroplane present possibilities worthy of thorough and immediate development.

A small engine that has, we believe, given very good results is the 2-cyl. opposed air-cooled model constructed by the Haacke Co., of Johannisthal, Berlin, who have also produced other successful engines in 3-cyl. fan-type 35 h.p., a 5-cyl. radial 60 h.p. and 10-cyl. radial 120 h.p. models—the former type being fitted to the W.K.F. sporting biplane previously described in FLIGHT (August 19, 1920).

The 2-cyl. model is made in two sizes, one having a bore and stroke of 112 mm. and 140 mm. respectively and developing 28 h.p. at 1,300 r.p.m., and the other having an increased bore of 120 mm., developing 30–35 h.p. The cylinders, which are semi-steel castings with integral cooling fins, are staggered $3\frac{1}{8}$ ins., allowing an exceptionally strong crankshaft construction. The valves are located in the head and are operated by push-rod and rocker arm mechanism of the conven-



The Haacke 30 h.p. Aero Engine: Side Elevation.

tional type. The timing gear housing is cast integrally with the crankcase. The latter is an aluminium casting so designed as to include a sump from which oil is drawn by two immersed plunger pumps operated by the two inlet cams. Each pump works independently, and squirts oil on to the crankshaft, which distributes it by centrifugal action. The sump, which has a capacity of .66 gal., or sufficient for 6–8 hours' running, is separated from the crankcase itself by a false bottom, provided with two constant level openings.

The cover of the crankcase is cast integrally with the magneto and tachometer mounting and intake manifold. The motor is attached to its mounting by means of four bolts passing through special lugs cast into the crankcase housing.

The weight of this engine is about 132 lbs., and the smaller model drives an air screw of 6 ft. 6 ins. diam. by 3 ft. 11 ins. pitch, whilst the larger model drives one of 7 ft. diam. by 3 ft. 7 ins. pitch.

R. M. GROVES MEMORIAL PRIZES FOR THE R.A.F.

A SUM of money to be expended annually during the next ten years has, we learn officially, been placed at the disposal of the Air Council by the generosity of the mother and other members of the family of the late Air-Commodore Robert Marsland Groves, C.B., D.S.O., A.F.C., who died last year as the result of an aeroplane accident in Egypt.

The prizes will be known as the "R. M. Groves Memorial Prizes," and are intended to stimulate that fine spirit of *esprit de corps* and of disinterested devotion to duty which was characteristic of Air-Commodore R. M. Groves throughout his service career.

The donor desires that the prizes should be open to all branches and all ranks of the Royal Air Force as a living memorial which may help and encourage others to emulate her son's fine example.

Each prize will consist of a set of bound volumes containing an autograph photograph of the late Air-Commodore Groves, and a suitable inscription as to the nature of the prize, the choice of the books (within certain limits) being left to the successful candidates. A grant of money will accompany each prize.

The prizes are divided into four groups :—

1. A Practical Flying Prize, open to flight cadets, which will be awarded twice annually on the recommendation of the Commandant of the Royal Air Force (Cadet) College to the flight cadet who, on passing out of the college, is the best all-round pilot of his term.

The prize will be a set of bound volumes, together with the sum of £25.

2. An Aerial Navigation Prize, open to officers who attend the aerial navigation course at Calshot, which will be awarded to the officer who passes out highest at the termination of the annual course.

The prize will be a set of bound volumes, together with the sum of £30.

3. An Aeronautical Research Prize, open to all serving officers, non-commissioned officers and men of the Royal Air Force, will be awarded to the officer, non-commissioned officer or man who, in the opinion of the Air Council, has done most during the preceding year to advance aeronautical science on the technical and research side.

The prize will be a set of bound volumes, together with the sum of £40.

4. Four prizes will also be awarded for an essay—the R. M. Groves Memorial Essay—on the subject of "A Forecast of Aerial Development," which will be set each year.

The essay, which will be open to all ranks of the Royal Air Force who fulfil the conditions laid down, is to be divided into three parts :—

Part I.—In relation to Imperial defence, with special reference to the possibility of maintaining equal or enhanced efficiency while securing economy by transferring some of the responsibilities of the older Services to the Royal Air Force.

Part II.—In relation to civil aviation, exploration, etc.

Part III.—An imaginative *résumé ;* Aviation in the next world-war.

The conditions are as follows :—

(i) All competitors must have made a cross-country or overseas flight of at least 100 miles either as pilot or observer or in some other Service capacity.

(ii) Papers are limited to 10,000 words.

(iii) Papers must reach the Air Ministry before April 1 in each year, except for this year, when the date is October 1.

(iv) The papers will be adjudged by a Committee chosen by the Air Council and comprised of three members, of whom one at least will be of the rank of Squadron Leader or Junior. The Chief of the Air Staff will act as referee.

(v) In each year the names of the prize winners for that year will be published in the Press.

(vi) The prize winners for any year will, in that year, appear in the R.A.F. lists as the R. M. Groves Memorial Prize winners.

(vii) The essays will be submitted in triplicate, and must be typewritten.

(viii) Every competitor must use a *nom de plume*, the actual essay bearing no indication of the name of the author. A sealed envelope containing the name, initials, rank and station of the author, and having the *nom de plume* written on the outside, will accompany each essay.

(ix) A competitor may give free scope to his imagination. H. G. Wells' "Anticipations" and "The Green Curve," and other stories included in the book of that name by "Ole Luk Oie," may be taken as a fair model of what is expected.

(x) All rights of publication rest with the Air Ministry.

The prizes are :—1st Prize, Books and £30 ; 2nd Prize, Books and £20 ; 3rd Prize, Books and £10.

In addition a Special Prize of £10 will be awarded for that part (either I, II or III) of any individual essay, other than those of the 1st and 2nd Prize winners, which shall be deemed by the judges to be the most striking and original.

The 9-Plane Caproni Destroyed

MISFORTUNE appears to have been the lot of the great "Nineplandem" Caproni "Hydravi." After badly crashing during her initial flips over Lake Maggiore, she was, according to the Rome correspondent of the *Petit Parisien*, last week-end completely destroyed by fire.

The Advent of the Owner-Driver

PROBABLY the first private individual to make extensive use of the aeroplane for touring purposes is Mr. A. S. Butler, who has purchased a "Puma"-engined Bristol Tourer, on which he is doing a good deal of flying. On Saturday last Mr. Butler left Croydon *en route* for the Riviera, *via* Paris, Lyon and Aix. Leaving Croydon at 1 p.m., he arrived at Bourget at 3.45 p.m. The Bristol Tourer is, of course, a very suitable machine for the private owner, combining a good turn of speed with economical fuel consumption, while the reliability of the Siddeley "Puma" is such as to make cross-country flying comparatively safe.

Shoreham Aerodrome to be Sold

ANNOUNCEMENT is made by Messrs. Weatherall and Green that they will offer by auction on May 10 the Shoreham Aerodrome (147 acres) with buildings and a railway "halt."

The Oehmichen Helicoper Flies

AFTER some seventy-odd ascents, the little helicoper designed by M. Oehmichen is stated to have succeeded in making a circular flight, returning to the point of starting. The flight was little more than a hop, but is of interest as a small step in the most serious problem of helicoper design—that of control. During the flight the machine reached a height of 16 ft., and travelled a distance of about 70 yds.

FLIGHT

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ANNUAL GENERAL MEETING

THE Annual General Meeting of the Members of the Royal Aero Club was held at 3, Clifford Street, London, W. 1, on Wednesday, March 30, 1921, at 6 p.m. Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Vice-Chairman of the Club, occupied the Chair, and stated that the Chairman of the Club, the Duke of Atholl, wished him to apologise for his absence from the Meeting on account of his being abroad.

The Chairman, in reviewing the work of the Club, stated that it was proposed to hold a number of sporting events this summer. The Club had voted £1,000 towards the expenses of the Aircraft Manufacturers competing in the Schneider Cup to be held at Venice in July. The Aerial Derby would be held at Hendon on July 16, 1921, and there was every prospect of an Oxford and Cambridge Race. Arrangements were also being made to hold a Seaplane Race at Cowes during the Cowes Yachting Week.

Efforts had recently been made to augment the Racing Fund, towards which the Club had voted £2,000, and a contribution of £200 had been received from Lord Cowdray It was hoped that other public spirited donors would come forward and assist.

The Flying Services Fund Committee, under the Chairmanship of H.R.H. The Duke of York, had during the year distributed £5,500 in grants and allowances. This had entailed a large amount of work on the Committee responsible for its administration. It should be pointed out that the whole of the expenses of administering this Fund were borne by the Club, so that all subscriptions received were used for the benefit of officers and men of the Royal Air Force incapacitated, and the dependants of those who had been killed. At the end of the year the balance in hand was £8,264.

Ballot for Committee.—As the result of the Ballot, the following Members were elected to fill the nine vacancies on the Committee :—

Lieut.-Col. John D. Dunville.
Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.
Lieut.-Col. F. K. McClean.
Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.
Viscount Northcliffe.
Lieut.-Col. Alec Ogilvie.
Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O.
F. Handley Page.
T. O. M. Sopwith.

Alteration to Club Rule 42.—On the motion of the Chairman, seconded by Sir Mortimer Singer, Club Rule 42 was altered to read as follows :—

"Any Ordinary Member may, with the approval of the Committee, either upon his election or at any time thereafter, compound by one payment for all his future subscriptions, and shall thereupon become a Life Member and be entitled to all privileges of membership for life, unless he shall cease to be a Member under the provisions of Rule 58, or be suspended, required to resign, or expelled under Rule 59. The compounding fee shall be seventy guineas, which fee shall, in the case of a Member becoming a Life Member on his election, include the subscription payable on election."

Election of President.—On the motion of the Chairman, seconded by Col. F. Lindsay Lloyd, C.M.G., C.B.E., the Duke of Atholl was unanimously elected President of the Club.

Election of Vice-President.—On the motion of the Chairman, seconded by Lieut.-Col. F. K. McClean, the Viscount Northcliffe was unanimously re-elected Vice-President.

Election of Council.—On the motion of Major H. A. Geaussent, seconded by Mr. E. D. Girardot, the Council for the ensuing year was unanimously elected as follows :—

S.A.I. Prince Roland Bonaparte (President F.A.I.).
The Earl of Hardwicke.
The Earl of Lonsdale.
The Rt. Hon. Lord Hugh Cecil, M.P.
The Lord Howard de Walden.
The Lord Kinnaird, K.T., F.R.G.S., D.L., J.P.
The Lord Montagu of Beaulieu, C.S.I.
Admiral of the Fleet The Rt. Hon. Sir Edward Seymour, O.M., G.C.B., G.C.V.O.
Admiral of the Fleet The Earl Beatty, O.M., G.C.B., G.C.V.O., D.S.O.
Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G.
Count Henry de La Vaulx (Vice-President Aero Club de France).
Sir David Salomons, Bart.
The Rt. Rev. Bishop Welldon.
Martin Dale.
Andre Michelin.
Sir Basil Zaharoff, G.B.E., G.C.B.
Air-Marshal Sir Hugh M. Trenchard, Bart., K.C.B., D.S.O.

Presentation of Medals to Sir Ross and Sir Keith Smith.—The Chairman presented Gold Medals to Sir Ross and Sir Keith Smith, and Bronze Medals to Sergt. J. M. Bennett and Sergt. W. H. Shiers, in recognition of their flight from England to Australia on November 12 to December 10, 1919. Sir Ross Smith, responding on behalf of his brother and the two mechanics, thanked the Club for the honour conferred upon them, and also for the assistance rendered to them by the Club in connection with the flight.

A vote of thanks to the Chairman concluded the Meeting.

Schneider Cup

The Race will be held at Venice during July 29, 30 and 31, 1921. Entries close on May 15, 1921.

The Royal Aero Club has voted £1,000 towards the expenses of the three competitors selected to represent Great Britain.

All enquiries should be addressed to the Secretary, Royal Aero Club, 3, Clifford Street, London, W. 1.

Royal Aero Club Racing Fund

The following contributions have been received by the Duke of Atholl, President of the Club :—

Lord Cowdray, £200.
Lord Dewar, £100.

THE FLYING SERVICES FUND

(*Registered under the War Charities Act*, 1916).

Administered by the Royal Aero Club

For the benefit of *Officers, Non-Commissioned Officers and Men* of the ROYAL AIR FORCE who are incapacitated while on duty, and for the widows and dependants of those who are killed or die from injuries or illness contracted while on duty.

Honorary Treasurer :
The Right Hon. LORD KINNAIRD.

Committee :
H.R.H. THE DUKE OF YORK, K.G. (*Chairman*).
Lieut.-Col. A. DORE, D.S.O.
Mr. CHESTER FOX.
Squad.-Leader T. O'B. HUBBARD, M.C., R.A.F.
Group-Capt. C. R. SAMSON, C.M.G., D.S.O., R.A.F.

Secretary :
H. E. PERRIN.

Bankers :
Messrs. BARCLAYS BANK, LTD., 4, Pall Mall East, London, S.W. 1.

Subscriptions	£	s.	d.
Total Subscriptions received to March 21, 1921	17,207	3	1
Squadron-Leader P. Litherland Teed, R.A.F. (Tenth contribution)	8	0	0
Total, April 4, 1921	17,215	3	1

Offices : THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

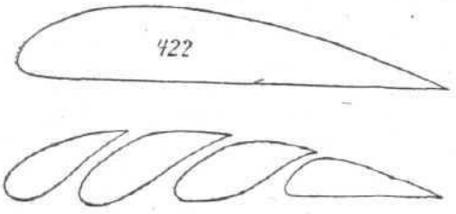
Morocco Air-Mail Extended

THE Postmaster-General announces that the air mail for Morocco now leaves Toulouse four times instead of three times a week, viz., on Mondays, Wednesdays, Thursdays and Saturdays, at 10.30 a.m. The latest time of posting at the General Post Office, London, is 6.30 a.m. (for printed papers 6 a.m.) on the preceding day, except in the case of the Monday air service, for which the latest time of posting at the General Post Office is 11 p.m. on Saturday (or 6 a.m. on Sunday with an extra fee of 1*d*.). Packets for Morocco posted on any day of the week, in London or the provinces, should normally be accelerated in transmission by the use of the air service.

THE GERMAN LACHMANN SLOTTED AEROFOIL

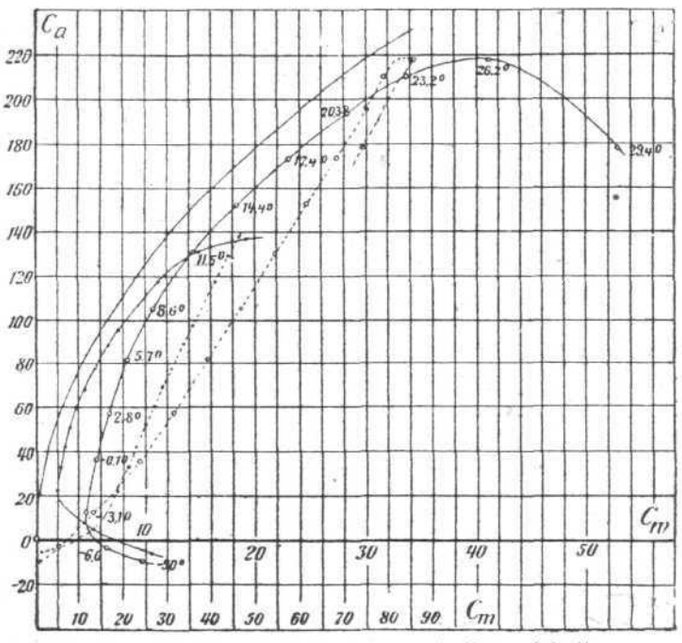
Göttingen Tests on a Model

IN the March 16 issue of the German aviation journal *Flugsport* is published a translation of Mr. Handley Page's lecture before the R.Ae.S. on the H.P. wing, and surprise is expressed at the poor figures of lift obtained in the Handley Page wind tunnel tests on the Lachmann wing, as well as at the fact that tests should be made on a section modelled from a rough Patent Specification drawing. Although the writer is justified in his remarks, it should be kept in mind that Mr. Handley Page had no other information relating to the Lachmann wing than that afforded by the aforementioned drawing. If, therefore, he wished to test the Lachmann section at all, he had perforce to base his tests on the only drawing available to him. That the results were disappointing is not to be wondered at, in view of the fact that, as



shown in the Patent drawing, the slots were obviously badly shaped, with much too narrow a gap at the top.

According to *Flugsport*, the Aerodynamic Laboratory at Göttingen has tested not only the Handley Page single-slot wing, but also the three-slot wing invented by Herr Lachmann. The Göttingen tests on the Handley Page single-slot section are said to have given the same results as those obtained at the N.P.L., while tests on the Lachmann three-slot wing have given results far superior to those obtained in the Handley Page tunnel with the section based on the Patent drawings. The accompanying graph shows the results obtained at Göttingen on the "Lachmann-Flügel." In the graph C_a is the lift coefficient, which is converted into our "absolute" coefficient by dividing C_a by 200. The same applies to the drag coefficient, C_w. The two full-line curves show the lift coefficients of the solid and slotted section respectively, while the dotted curves are drag coefficient curves. In the smaller illustration are shown the full and slotted sections. It will be seen that with the solid section the maximum lift coefficient is about 137 (0·685 abs.), while the slotted section reaches a lift coefficient of 218 (1·09 abs.) at an angle of incidence of 26·2°. The increase in lift is thus about 63 per cent., which is no better than the increase obtained by Handley Page with one slot. *Flugsport* states that the increase in lift is about 90 per cent. How this figure is arrived at we do not profess to know, certainly not from the Göttingen curves. It is true



that the journal states that the increase is "*ungefähr*" 90 per cent. It seems to us that it is very "*ungefähr*," as there is a great jump from 63 per cent. to 90 per cent. Whatever may be the opinion of priority, there does not appear to be any doubt that Herr Lachmann has a long way to go yet before he learns to give his slots such a shape that the same results are obtained as those reached by Mr. Handley Page.

ROYAL AERONAUTICAL SOCIETY NOTICES

Wilbur Wright Lecture.—"Scientific Methods in Aeronautics," delivered by Major G. I. Taylor at the Royal Society of Arts, on April 12 at 8 p.m.

Annual General Meeting.—This was held on March 31, when the Council's amendments to the Rules were adopted. The new Rules for the admission of Fellows and Associate Fellows, including the regulations for Associate Fellowship examinations, were also passed, and steps are being taken immediately to put these into force.

The following Members were elected to serve on the Council for the years 1921–1922 :—

Dr. L. Bairstow, C.B.E., F.R.S.; Wing-Comdr. T. R. Cave-Browne-Cave, C.B.E.; Sir Robert Hadfield, Bart., F.R.S.; Capt. G. de Havilland, O.B.E., A.F.C.; Lt.-Col. J. T. C. Moore-Brabazon; Lt.-Col. A. Ogilvie, C.B.E.; Lt.-Col. M. O'Gorman, C.B.; Col. The Master of Sempill; Major R. V. Southwell; and Lt.-Col. H. T. Tizard, A.F.C.

Aeronautical Journal.—The April issue of the *Aeronautical Journal* contains Lord Montagu of Beaulieu's paper on "The Cost of Air Ton-Miles Compared with Other Forms of Transport," and a paper on "Aircraft *versus* Submarine," read before the Scottish Branch by Col. L. H. Strain.

Donation.—The Council desire gratefully to acknowledge the gift of "Telegraphy, Aeronautics and War," by Sir Charles Bright, the author.

W. LOCKWOOD MARSH,
Secretary

OIL-PROSPECTING BY SUPERMARINE

IN reference to the oil prospecting expedition to Venezuela per Supermarine flying boats, mentioned in last week's FLIGHT, we understand that the expedition is under the leadership of Major Cochran Patrick, D.S.O., M.C., who is accompanied by two pilots, Messrs. C. E. Ward and F. Bailey, and three highly qualified rigger and fitter assistants.

The photographic part of the work is in the capable hands of Mr. W. D. Corse, a very expert aerial photographer, who will be backed up by three assistants, who have all had much experience of such work in the R.A.F. The camera which will be used is of the L.B. type, and it is understood that the photographic gear alone has cost about £1,300.

The party will live in two steel barges, which will be moored in one of the main streams of the delta.

After the survey work on the Orinoco has been put well in hand, Major Patrick will move on to British Guiana, to arrange with the Government there for an aerial survey of that colony. The inhabited coastal strip is separated from the savannahs of the interior by a belt of dense forest, and the rivers which traverse it are rendered unnavigable to anything larger than a canoe by numerous rapids. Development of the colony is impossible until a satisfactory map has been made, and the Government has therefore opened negotiations with the Bermuda and West Atlantic Aviation Co.

FLIGHT

CAMBRIDGE UNIVERSITY AERONAUTICAL SOCIETY

(OFFICIAL ORGAN "FLIGHT")

ON March 9, 1921, a very interesting and instructive paper was read by Sir Napier Shaw, Sc.D., F.R.S., F.R.Ae.S, entitled—

The Artificial Control of Weather

The lecturer referred to the extraordinary grip which the subject of weather control had on the imagination of the ancients, and how it is constantly referred to in the Greek mythology, where Zeus controlled the thunder and his deputy, Æolus, the wind. Right down the times the subject has occupied the minds of men, and among the more common modern applications attempted are the precipitation of rain by gun fire, and the avoidance of hail by the dissipation of thunder clouds. The lecturer mentioned examples of the desired effect having, apparently, been attained, but called attention to natural changes in the weather which were due about the same time, and he left it to his audience to judge which was the more likely cause of the two.

For the benefit of those who still adhere to the belief that weather control is possible today, it may be stated that the distinguished weather expert admitted that many of the forms of control suggested are not impossible, any more than it is impossible to build a jetty 200 miles long for the purpose of diverting the Labrador Current, as was proposed some years ago. As the lecturer said, "There is nothing which can be called impossible in building a jetty 1 mile long, and a 200-mile jetty is only 200 times as long. It can only be a question of money, material and perseverance. But for practical purposes impossibility is reached when the money and material required exceed the limit of what is available, and it is from that point of view that all proposals for the human control of the weather have to be viewed."

One of the problems in weather control that would be of the greatest importance to aviation is the dispersal of fog. On this question the lecturer made the following statement, which we publish in full, as it may save those who are tackling the problem a great deal of valuable grey matter :—

"It would appear from experience that the easiest way of disposing of the comparatively calm fogs of an aerodrome is to get up a slight wind and blow them away. Captain Carpenter in his report on London fogs in 1902, found that valley fogs could not survive a second of wind at Kew beyond 13 m.p.h. (Factor 3); the same process would not work for hill tops. Such a wind corresponds with a difference of pressure of a millibar in 75 nautical miles. A bank of air three metres high along one side of a quarter mile aerodrome would be sufficient and it seems rather absurd to call the maintenance of such a bank impossible. But it is so.

"A more reasonable suggestion was made to me some months ago in a letter from a Flying-Officer. He had noticed that the players in a football match which he was watching kept themselves clearly visible while the rest of the ground was befogged up to a thickness of about 30 yards. He supposed that the air was dead calm, and spaces might therefore be permanently cleared by local heating. It is, however, an essential pecularity of fog that the air in which it floats is never really still, it always has a slow drift, as anyone can see who watches a fog from the inside. In fact, if there were no drift there would be no fog problem. The drops would sink to the ground. Gravity would do the work of removing them in the simplest possible manner. It is only the eddy motion accompanying the drift that keeps the drops persistently in the air by preventing them settling. Taking the drift at two miles an hour, I made a rough computation of the coal required to clear an aerodrome 400 yards wide. It worked out at about 12 tons an hour for coal consumption, for a 50-feet fog, and ran up to 400 or 500 tons an hour as an outside figure to meet ordinary contingencies using electrical distribution. Again it is simply a question of magnitude. I have myself no practical conception of the amount of combustion which is implied by 12 tons or 100 tons an hour. My sheet anchor about coal is that a fire in my college-room used about two hundredweight in a week of about 100 hours, or about one thousandth of a ton per hour. So 12 tons per hour is the equivalent of 12,000 college-rooms. Shall we say five times the consumption of the University and Colleges of Cambridge ? Such an amount of combustion is hardly to be called impossible, but no other adjective is so nearly an expression of the facts.

"If we approach the same problem by mechanical means and endeavour to drive away the foggy air of an aerodrome by propellers capable of giving a speed of 100 kilometres per hour to the propelled stream we find ourselves in the same difficulty. We arrive at figures for which 'impossible' is only too strong a word if you disregard all questions of cost and effort.

"What it comes to then is that all the suggestions for the human control of weather oppress one, not always by mistaken conception of physical processes, but by the 'scale effect.' Within our knowledge we are lords of every single specimen of the atmosphere which we can bottle up and imprison in our laboratories, our furnace flues or our greenhouses; but in the open air the ordinary inexorable laws which control the behaviour of the atmosphere, when we are awake and when we are asleep, have such enormous quantities of energy in the form of warmth and water-vapour in reserve that our own little reserves are not equal to making any serious impression on the course of nature.

"Yet the course of the weather may be affected by what may be regarded as violent artificial means, such as the explosions of a great volcano. In a recent work by Professor W. J. Humphreys the suggestion has been put forward that cold summers and even glacial periods have been caused in that way, and I see a prize is offered for an essay on the connection between vulcanism and storms, among other things.

"So perhaps we might give a new turn to our thoughts by exploring how far our reserves of available energy compare with the destruction of Pompeii, the disappearance of the island of Krakatoa or the eruptions of Mt. Pelée and La Souffrière. In any case it is the law of conservation of energy which we have to bear in mind, and it is the vastness of the volume and mass of the air affected which has hitherto offered insuperable obstacles to the application of known physical processes for the control of weather. Any new physical process to be successful will have to arrange for a great economy in the energy required, or give us access to supplies of energy which are not now available."

Launch of "R. 36"

ON Friday, April 1, the "R. 36" was launched at the Inchinnan works of Messrs. William Beardmore and Co., Ltd. Leaving Inchinnan at 3.15 p.m., the airship cruised about, paying a visit to Glasgow, and returned to her shed at Inchinnan at 6.20 p.m., after a very successful maiden flight of close on three hours' duration. The "R. 36," or G.-F.A.A.F. to give her her civil registration mark, was designed in 1918 by the Admiralty, and is the first British airship to be adapted for commercial work. She has cabin accommodation for 50 passengers in a special cabin built on to the main structure.

And Her Night Trip to Pulham

AFTER her successful trial flight on Friday, the "R. 36" left her shed at Inchinnan on the evening of Saturday, April 2, for her station at Pulham, Norfolk. She was brought out of her shed and cast off without a hitch, leaving Inchinnan at 7.40 p.m. with a distinguished party on board, among whom were Lord Weir of Eastwood, General Weir, General Maitland, and General Brooke-Popham. After leaving Inchinnan, "R. 36" proceeded leisurely on her way to Pulham, her log for the trip being as follows :—Dunbar, 9 p.m.; Farne Island, 10 p.m.; mouth of River Tyne, 11 p.m.; Flamborough Head, 1 a.m. (Sunday morning); Howden, 2 a.m.; Skegness, 3 a.m.; Hunstanton, 4 a.m.; Mundesley, 6 a.m.; Pulham, 12.52 p.m. It should be pointed out that no attempt was made at making a fast passage, the journey being completed in a leisurely fashion so as to make observations and get the ship "run in." On April 5 she left Pulham at 7.40 a.m. for a cruise, arriving over London about 9.30. After leaving London "R.36" was to proceed to the South Coast, and thence along the coast to Land's End. From there it was intended that she should turn north, going as far as Liverpool, whence she was to cross eastwards to her base at Pulham. Owing to some minor adjustments being required the trip was not carried out, "R.36" returning to Pulham at 9.10 p.m.

Another Giant Aeroplane

FROM Turin it is reported that another Italian constructor —this time Signor Ricci—is completing a huge machine. The Ricci, unlike the ill-fated Caproni, is stated to be a quadruplane, with a total horse-power of 5,000 and a wing area of 8,600 sq. ft. The machine is designed to carry 130 passengers, and the estimated speed is about 90 m.p.h. The useful load is given as 20 tons.

AIRISMS FROM THE FOUR WINDS

IT looks as if the United States is likely to follow the lead of Great Britain in having "one Air Service, one Badge, one Uniform." Good.

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CROYDON AERODROME is to remain "semi-dry," as on Monday, the Surrey Licensing Committee at Kingston granted a licence for the sale of intoxicating drinks at Croydon Aerodrome to travellers by air. Presumably their friends will have to look on meanwhile.

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IT seems pretty poor recognition by the Government of good work done for the Nation when a man of Mr. E. R. Calthrop's calibre, the inventor of the "Guardian Angel" parachute, should have to make his protest of not being able to get his substantially admitted claim settled by the Government in regard to his great life-saving invention, by pleading inability to pay his local rates. His case as stated by himself was: "I am unable to pay, as my income is less than the rate and income tax. I am the unfortunate inventor of the 'Guardian Angel' parachute, and have spent £12,000 experimenting. My claim against the Air Ministry is substantially admitted, and I shall be asked to compromise." Three months were allowed for payment, and Mr. Calthrop presumably may these days consider himself fortunate in not having got three months' hard labour for having dared to do anything really useful for the Nation.

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DOPE of the right sort when applied either outwardly or inwardly is quite a good form of sport. But apparently aeroplane dope is not to be recommended to poultry farmers, as the Ministry of Agriculture has just issued a warning against keeping poultry in houses or runs constructed of untarred aeroplane wings or fabric. The birds are, in the opinion of experts, liable to poisoning either by picking off the "dope" or dressing, or from the vapour which may be given off. It is believed, however, that there is little, if any, risk if the materials are well tarred. Lime must not be used.

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"LEST we forget" a German bomb has been hung in East Bergholt Church, near Colchester, with an inscription as follows:—"This bomb is one of 40 or more dropped on our parish by a German airship, September 12, 1915, yet no one injured. Thank God."

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ALTHOUGH the Divine Sarah was willing—even anxious—to chance getting nearer to Heaven *en route* to this Island *via* the air, last Saturday, she was prevailed upon by her son to forego her desire and travel by more prosaic methods. Perhaps, having regard to Madame Bernhardt's present physical condition, the decision may appear to have been wise, although judging by her reported experiences by motor-car and boat the great actress would have been very, very much better off and less inconvenienced had she adhered to her original resolve. For invalids voyage by air is about as ideal as could be wished.

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THAT Paris "mystery aeroplane" of the night which, on March 5, is said to have raised quite a flutter of excitement in France is not very terrible after all, and this time the Boche is innocent. It was just Lieut. Rabattel, on a Nieuport, who was descending from a pretty high ceiling, and his repeated cuttings-out of his engine whilst over Paris was not apparently understood by the lay reporter and other nervous folk who happened to hear this nocturnal visitor passing over.

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IT is to the good that the question of smuggling dogs into this country—whether by aeroplane, as alleged, or otherwise—was brought forward by Lord Bledisloe the other day in the Lords, and that the feeling, concurred in on behalf of the Government, by the Earl of Crawford, was to increase the penalty for transgression very substantially. In our view, hard labour is the *only* real remedy to touch the selfish delinquents, and it is to be hoped *that* will be the stuff they'll give 'em. But, all the same, a good case is hardly helped, rather spoiled, by dubbing the friend of man "useless brutes" as Lord Willoughby de Broke put it. Sympathetic support for the main principle is easily jeopardised by such ill-judged criticism.

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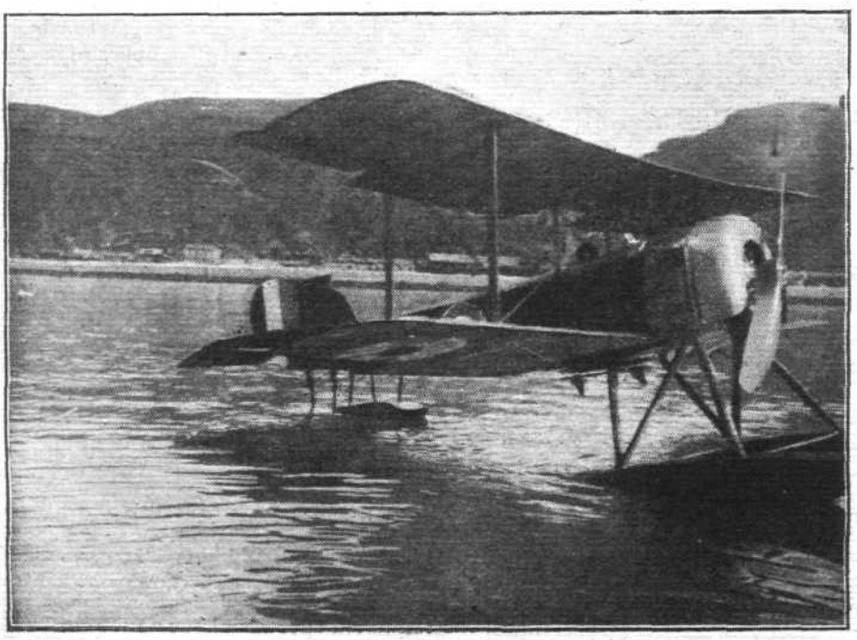
FROM Mr. William Preston, Talcahuana, Chile, who is helping along aviation with the Chilian Government, we received some little time ago the accompanying photograph, Mr. Preston referring to it in his letter as follows:—

"I enclose a snapshot of one of the Baby Sopwith Seaplanes which were received by the Chilian Government in 1919. This machine, No. 2103, was, according to the Log-Book, employed during the years of War by the R.N.A.S. at Killingholme, and completed over thirty hours' flying.

"Out here it was flown by the Chilian Naval Pilot, Lieut. Francke, who completed fourteen hours of flight, but after this had the misfortune to strike a piece of floating timber, which broke up a main float, and the machine turned turtle. I imagine this snapshot, if reproduced in FLIGHT, would be of interest to many of your readers, especially R.N.A.S. officers who may have flown the machine at Killingholme."



Schneider Cup Baby Sopwith seaplane, No. 2103, now in the service of the Chilian Government at Talcahuana

FLIGHT

FLYING BOAT CONSTRUCTION

By DAVID NICOLSON, A.M.I.N.A., A.F.R.Ae.S.

(*Concluded from page 229.*)

Types "P." and "N."

GENERALLY the hull construction of the "P." and "N." types consists of a number of stringers disposed around the more or less circular section of the boat. (See Photo. No. 6, Circular Section of P.5.)

Stringers.—The longitudinal stringers are of spruce, 2½ ins., moulded at amidships, tapering to 1 in. forward and ¾ in. aft, all sided $\frac{5}{16}$ in. All the stringers have a pair of spruce fillets at the bottom and a pair of similar fillets at the top, all of which are glued and fastened through the floors and skin. I suggest that these stringers and fillets should be worked out of the solid, forming a lighter and stronger "I" girder.

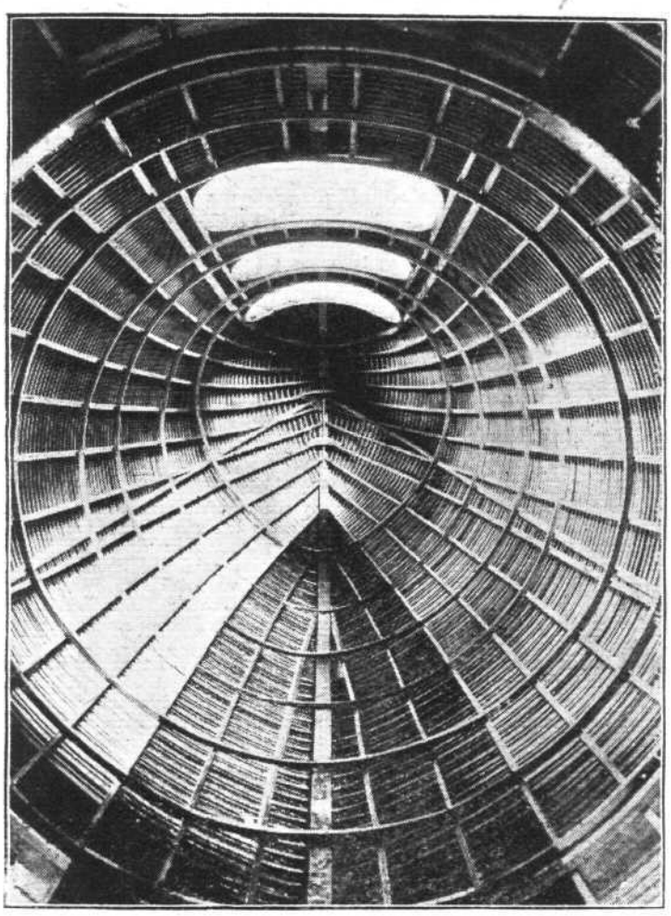


Photo. No. 6.—The P5, showing circular section.

The stringers are secured to interior bent wood hoops of rock elm spaced at intervals apart and extending in planes transversely to the longitudinal axis. The hoops are doubled in wake of the spars alternately scarfed at the top and bottom.

Timbers.—Externally, around the longitudinal stringers, are a number of bent wood ribs or timber of rock elm, moulded $\frac{5}{16}$ in., sided ⅜ in. and spaced 2 ins. apart, except at the bow, where they are fitted as cant timbers and spaced 2½ ins. apart. All timbers are in one piece, bent right round the hull with the ends at the keel, into which they are joggled and glued to the stringers.

Floor Timbers.—The bent floor timbers are of rock elm, ⅝ in. moulded, sided ⅜ in. at the centre of the keel and tapered to ¼ in. moulded and ⅜ in. sided at the ends, all of which embrace one-quarter of the hull, thus ensuring perfect transverse continuity of strength in the timbers.

Keel.—The keel is of rock elm, moulded 1¾ ins., sided 3 ins. at amidships and tapered at the ends. It is in one piece and runs up to form the stem and is a great improvement on the construction adopted in the "F." type.

Keelson.—The keelson is of spruce, 5 ins. moulded at amidships and tapered to stem on fore end and to 2 ins. on after end. It is sided ⅝ in. parallel throughout. The bottom is carefully joggled over the floors and glued and secured to the keel by two spruce fillets, which are glued and through-fastened to the keelson, keel and floors. The top side of keelson is rabbeted into the underside of a top member or flange, which is secured by glue and screws. This top member or flange is of spruce, moulded ⅞ in. at centre and tapering to ¾ in., sided 2½ ins. at centre tapering to stem forward and to 1¼ ins. aft; the keel, keelson and top member forms a very strong "I" girder.

Sternpost and Saddle Straps.—The sternpost is of mahogany, 3 ins. moulded and sided, which extends to 1 ft. above the hull. Saddle straps of elm are fitted, those at the main spars and tail-plane struts are in one piece, running round the boat with their ends fastened to the keel, as in the case of ordinary timbers, and of the same thickness. (See Photo. No. 7 for Timbers, Stringers and Straps.)

Doublers.—In addition, doublings of English elm are fitted at the wing root stay plates at front and rear spars. These doublings are carried in a fore and aft direction for a length

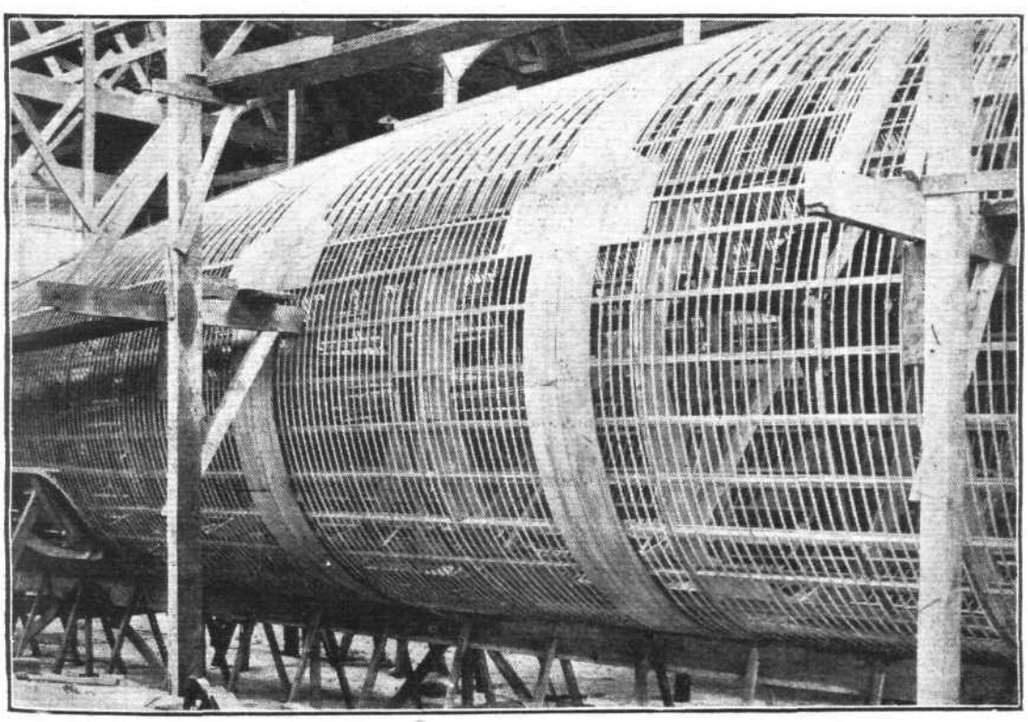


Photo. No. 7.—The N4 Titania, showing timbers, stringers, and straps.

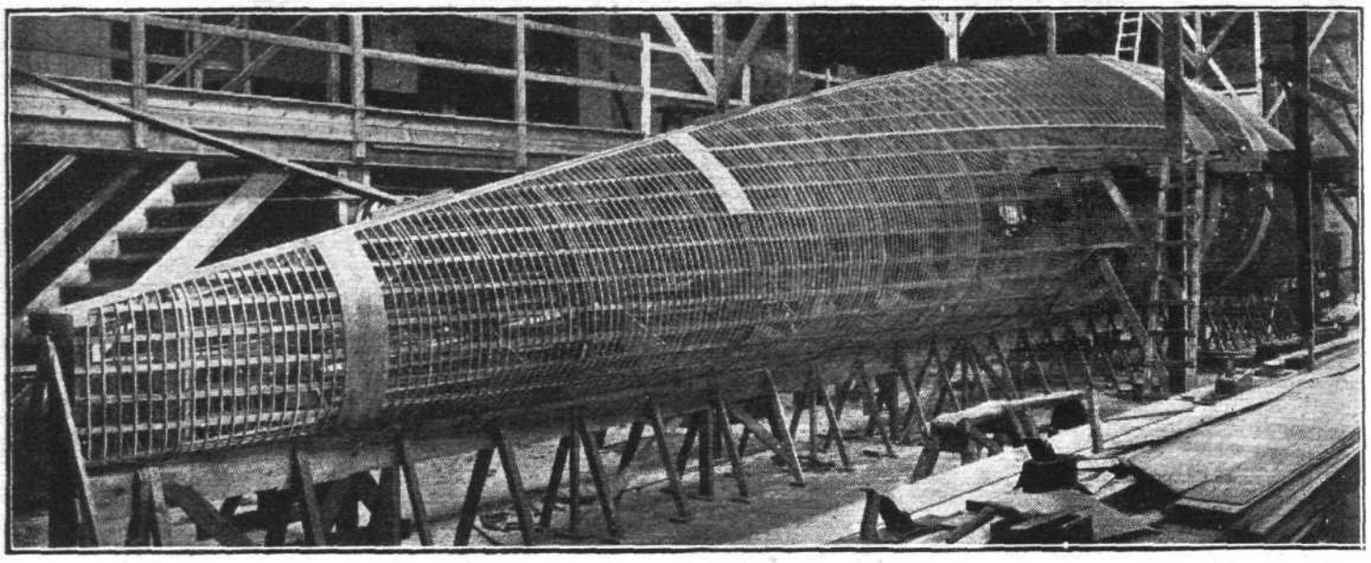


Photo. No. 8.—N4. Complete hull in frame.

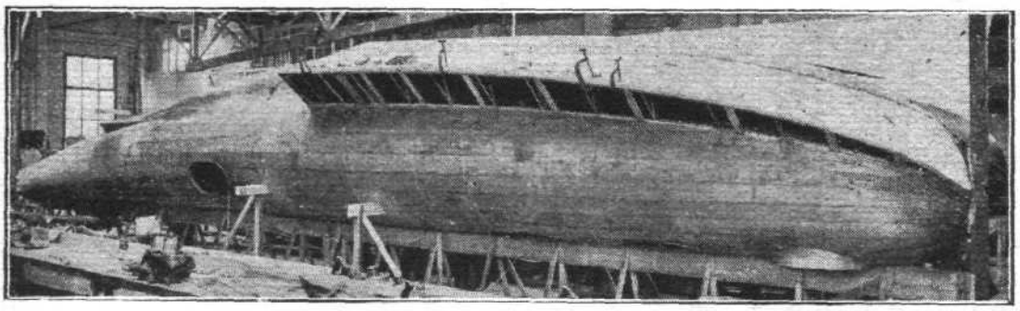


Photo. No. 9.—P5, showing planking and steps.

of 30 ins., carefully joggled over the timbers and floors. (See Photo. No. 8, N4 Complete Hull in Frame.)

Planking.—The planking is of Honduras mahogany fitted in narrow widths with close seams. The inner skin, $\frac{3}{32}$ in. thick, being laid diagonally, the outer skin, $\frac{3}{16}$ in. thick of the same material, is laid fore and aft. I am of the opinion this might be improved by fitting the diagonal planking 45° inside and 35° outside, and as the stringers run fore and aft, this would make a very strong job. The saving in labour would be considerable; roughly it might be stated if in the N. 4 ten men took three weeks to do the outer skin fore and aft, eight men would do the same diagonally in two weeks. In the first case the wages bill would be, say, £150, and in the second £80, which shows a saving of nearly 50 per cent. One has only to consider the time spent in dividing out and in tapering and shaping the planks fore and aft to appreciate the above.

Varnished nainsook is laid between these skins; this not only makes a watertight job, but is light and very strong. The inner diagonal skin is held in position with copper pins, the outer being through-fastened to the timbers with copper nails, the ends turned on the face of the timbers.

Steps.—Outside the main structure already described, a double bottom or water planing surface is fitted, known as the step. The water planes are framed up forward of the main step with three-ply birch and small stiffeners, the frames being spaced 18 ins. apart and secured to the inner hull planing-bottom with spruce fillets.

The chine of rock elm is in one piece and tapered from 1½ ins. by 1½ ins. at the front step to 1¼ ins. by 1 in. at the stem. The stringers are of spruce all in one piece fore and aft, fitted through the three-ply frames, which are fixed to them by small fillets.

The timbers are of rock elm of the same size and spacing as in the main hull, the ends joggled into the chines and tapered to fit the hull. They are secured to the face of the stringers with glue and light copper pins. The bottom is planked with a double skin of mahogany with varnished nainsook between, similar to the main hull. (See Photo. No. 9, P5 showing planking and steps.)

Fin Top.—The fin top is framed with rock elm timbers spaced 2 ins. apart, the ends being joggled into the chines and into a fillet of rock elm. The whole is planked in a

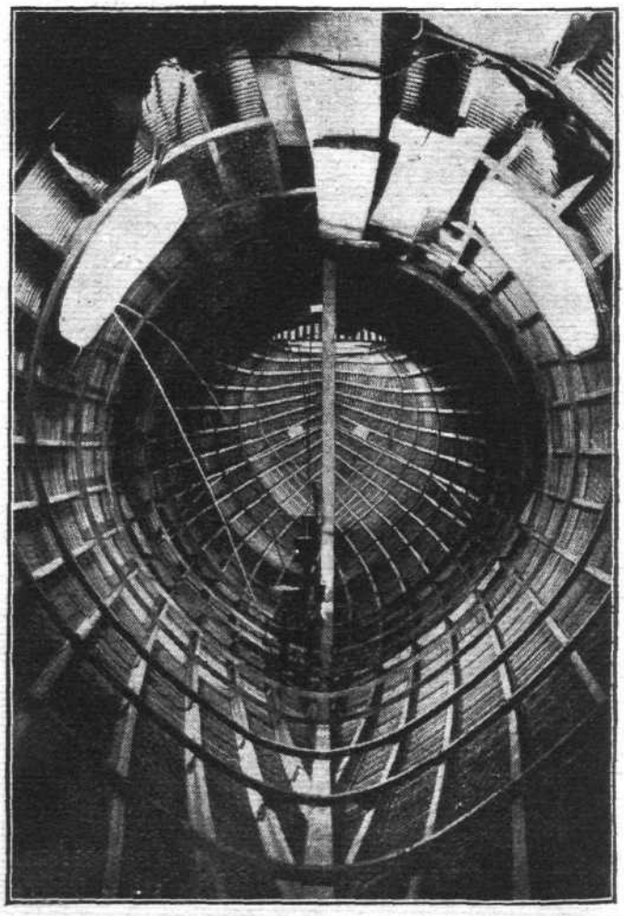
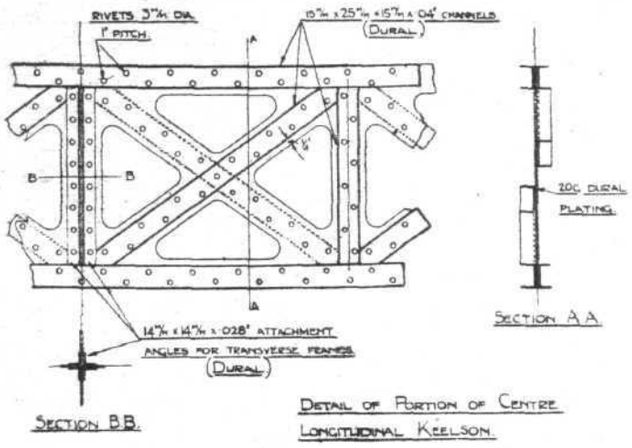


Photo. No. 10.—The N4 Titania. Interior view looking forward.

FLIGHT

similar manner to the inner hull, carefully fitted to the chine and hull-fillet rabbets and closely fastened with screws.

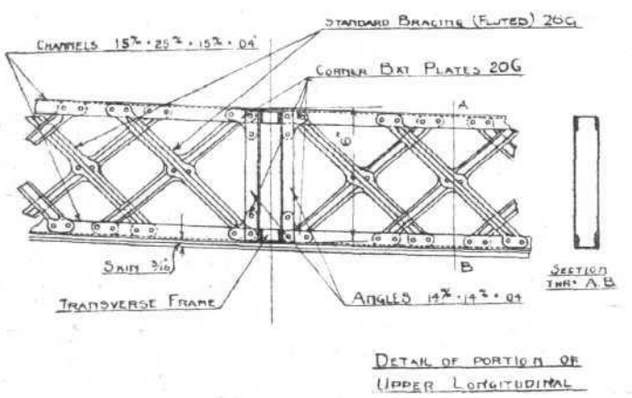
Protection Plates.—Rubbing plates of $\frac{1}{16}$-in. brass, bent to the shape of the bottom, are fitted along the keel, and the chines are also protected by brass strips fitted along the



Sketch 1.

sides and bottom with the fore ends let in flush and secured by screws.

A strong point in favour of the small transverse framed hull is its resiliency, as it does not depend for its efficiency upon the rigidity of the parts comprising it. (See Photo. No. 10, N4 Interior View Looking Forward.) Up to the present all flying boats have been built principally of wood, but Messrs. Beardmore have recently taken the next step towards advancement in building a composite boat. This is a



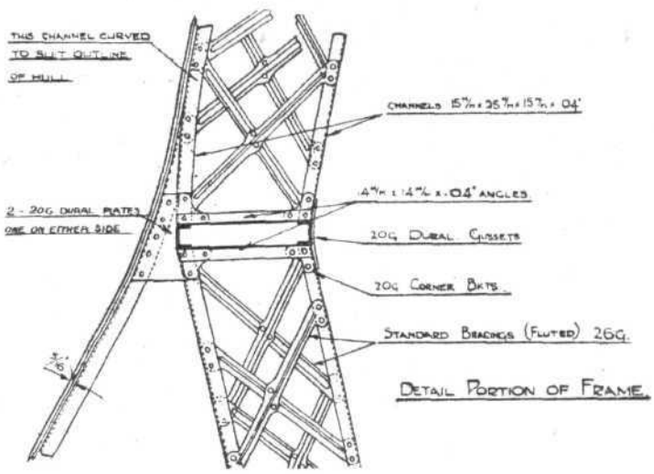
Sketch 2.

stage in construction shipbuilders arrived at many years ago, and at that time many problems had to be solved to get a satisfactory job. However, Naval Architects mastered all the problems, with the result many good composite boats are still in commission. The composite boat known as "W.B.IX.," built by Beardmore, is on the longitudinal system, the main portion of the hull being of approximately circular form. There are 17 continuous longitudinals, which run right fore and aft, care being taken that none of these members are cut throughout their entire length. The seven longitudinals on the lower side of the hull are built as shown in sketch 1, and the remaining longitudinals on the top side are built as shown in sketch 2. The channels forming these longitudinals are of duralumin 25 mm. × 15 mm. × 15 mm. × .04 in. thick, and are braced as shown in sketches 1 and 2.

The main transverse frames are intercostal between the fore and aft longitudinals and are spaced along the boat at approximately 2 ft. apart. (For construction see sketch 3.) The channels forming the transverse frames are the same size as those in the longitudinals. The transverse frames are connected to the longitudinals by duralumin double angles 14 mm. × 14 mm. × .028 in. and gusset plates of .04 in. thick. The framing from keel to chines and from chines to hull side is formed of duralumin channels 25 mm. × 15 mm. × 15 mm. × .04 in., this framing being braced and supported to the main portion of the hull by duralumin channels and gusset plates.

Intermediate transverse framing is fitted from chine to keel and keel to chine on the bottom of the boat, the spacing of these transverse frames being approximately 8 ins. Intermediate longitudinal frames are also fitted approximately 6 ins. apart, the latter framework forming a support for the skin of boat. These intermediate transverse and longitudinal frames are formed of light duralumin channels .033 in. thick and .04 in. thick as required. The intermediate transverse and longitudinal framing on the top of the boat is of similar construction to that on the bottom, the framing at this part forming 8-in. squares of the same section of channel.

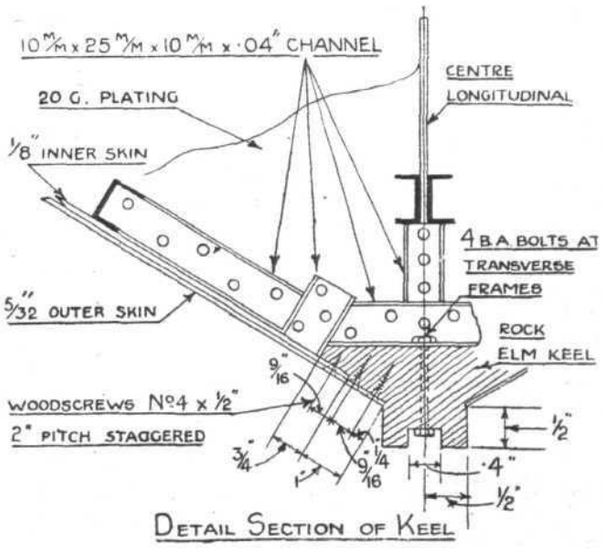
The continuous main longitudinals run right forward and finish into a heavy transverse nose frame built of duralumin channel and plate, thereby forming a very rigid structure forward. In front of this frame the nose of the boat is made of a removable steel nose cap which can be removed and replaced in the event of damage. The keel and chines are of



Sketch 3.

American rock elm and are double rabbetted to take the two-ply skin. (See sketches 4 and 5.) This double rabbet is a great improvement over the method adopted in the F. boats, but the chine piece would have been better if a greater distance had been left between the edge and end of planking.

The skin below the chines is formed of two thicknesses of mahogany planking, the inner thickness being $\frac{1}{8}$ in. laid at an angle of 45°, and the outer thickness $\frac{5}{32}$ in. laid fore and aft. One ply of varnished cotton fabric is laid between the mahogany skins. The skin is fastened to the duralumin

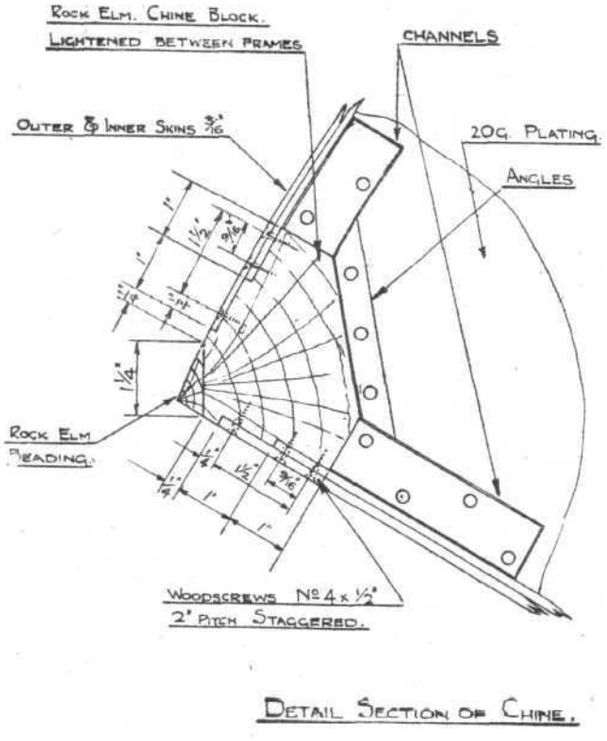


Sketch 4.

framing by $\frac{1}{16}$ in. duralumin nails clenched over rooves in the inside of the hull. The two skins clear of the framing are riveted together with similar nails clenched over rooves. The skin above the chines is of two thicknesses, each $\frac{3}{32}$ in. mahogany, the inner thickness laid at 45° and the outer thickness fore and aft, with varnished fabric between. Attachment to framing is similar to that of the bottom skin. The builders have avoided many of the mistakes the early

constructors made in the fastenings, as for instance in some of the F. 3 boats there were only about 60 rivets per square foot; but I am of the opinion Beardmore have overdone the fastening, as they have about 160 rivets per square foot in the skin.

The framing in way of the step is of wood, and consists of eight ½-in. elm fore and aft formers and 23 ½-in. by ⅜-in. rock



DETAIL SECTION OF CHINE.

Sketch 5.

elm transverse formers each side of centre line, with finishing transverse former at rear end of step ⅝ in. by ⅝ in. rock elm. The step is open to the sea, no attempt having been made meantime to provide watertightness. Six 2¾-in. diameter vent holes spaced 15 ins. centres are provided on the bottom of the hull, just aft of the step, to ventilate same. These vent holes are led into a common pipe, one on each side, and led out from skin about 15 ins. above the load water-line. Watertightness is provided where the vent pipes go through the hull bottom by rubber rings and dished washer plates, the end of the pipe being spun over on the outside. The sternpost is of duralumin 2 ins. by 1 in. solid in section faced on each side by elm blocks, to make up the line of hull. From the sternpost forward 1 ft. 10 ins., in the centre of the boat, duralumin plating is fitted from keel to top, reinforced with duralumin channels to provide for landing shocks in way of rear skid.

The engine-bearers are built of duralumin channels and plates, and are placed on the main fore and aft bottom longitudinals to distribute the load over the hull.

There are three watertight bulkheads fitted in the length of the boat. A hand-winding anchor gear is provided in the nose, the cable being led through the fore foot; the structure being suitably reinforced in the vicinity and a watertight cable guide provided.

In order to prevent corrosion, the whole of the duralumin framework is coated with oleo resin asphaltum varnish, this being done during construction in order that all joints are well protected. Inside the boat, in way of the engine room, there is an additional two coats of paint composed of graphite and tung oil varnish. The whole structure is enormously strong, in fact too strong for the work it has to perform, with the result that the hull is much too heavy. The framework is so rigid that the boat could at any time be completely replanked without distortion to the shape of the general lines. This boat has not yet been tested, but I am afraid the rigidity of the hull will prove to be one of the weak points in the design. The details and general workmanship are very good, and show a great improvement on many of the service boats.

Supermarine Four-Seater

The construction is such that the hull is capable of resilient distortion, so that when alighting on the water or when subject to other forces the hull can spring, thereby materially reducing the effect of the shock. The cross section is egg-shaped, being very light, and yet possesses great strength. The hull is built up of longitudinal stringers, with bent hoop timbers inside and light frames outside the stringers, with double planking outside the light frames, all these being through-fastened together. The stringers are recessed to take the light frames, thus giving a good faying surface for the skin. The keelson constitutes a stringer, as it is of similar section.

One of the principal features of this design is that no web frames or cross-bracings are required. The hull is a continuous structure, so that the steps are built on to the skin planking. The top of step is connected to a longitudinal fin member, while the bottom is secured directly by small timbers to the hull. The fins are supported inside by thwartship cross members, small bulkheads and longitudinal members, to give the requisite strength for this member. As many of the sections are of similar design and construction, this lends itself to quick production. All the stringers can be run out in the mill, also the timbers, thus a fair percentage of the work can be executed in running lengths, this being a great improvement on the construction of the "F." type, with so many different sections and details which require to be done by hand. If these boats are being built in numbers, all the planking can be cut in pairs. The diagonal planking being parallel and of equal thickness, can, together with the stringers, timbers, etc., be made stock sizes and issued out in lengths from the store. As a commercial and production proposition the following are the outstanding features:—The reduction of raw material to mahogany, rock elm and spruce, brasswood screws, copper nails and rooves, fabric, marine glue, black varnish and boat varnish, the first of which can be converted into ⅛-in. planking of convenient lengths and widths (¼ in. by ¼ in., ⅜ in. by ⅜ in.), or ½ in. by ½ in. rock elm timbers into suitable lengths, stringers of spruce into suitable lengths, and be issued out on the job as required or in suitable quantities for the construction of each hull.

Take a hull of 35 ft. in length. You can employ one class of labour only—for instance, boatbuilders; a small number of men and boys can be placed on this job, and if piece-worked, with the exception of supervision and inspection, the chances of hold-up through materials are so small, owing to there being no complication, that they can carry straight through and finish their job. Compare this, for example, with a flying boat of the F.3 or F.5 type. You have to start criticising this at the ordinary commercial proposition, in the first instance, of storekeeping. You run into such items as turnbuckles, bolts and nuts, wires, cables, sheet steel, steel tubing, in fact a hundred and one parts that go to the building of a large aeroplane's *fuselage*. You must employ not one trade but quite a number, such as boatbuilders, carpenters, sheet metal workers, fitters, machine hands, wiremen, riggers, and are immediately in the midst of demarcation troubles, allocation and arrangement of working squads, processing in a dozen different ways; your inspection costs go up in many details, all of which are liable to hold up the job—even a small point if turned down in inspection can completely stop the job for days on end—and if the question of finished stores is not a highly organised one, a small bolt and nut, wiring plate, etc., going adrift means a stoppage. Stoppage means money, and invariably these stoppages occur which, apart from their own cost, lower the moral of the particular men who are working for completion on the job. Without going into further detail, the foregoing, I think, points out the advantages and disadvantages of the two types from a construction point of view both from ease of construction, expense and on-costs.

During the recent year the Supermarine Company have patented a flexible bulkhead. Owing to the work of the hulls when in any kind of sea-way, it is impossible to make rigid fastenings to the hull: in fact, if this is done the object of the flexible hull is at once destroyed, and if heavily strained the same experience is found in light racing launches; the hull, although not breaking at the bulkhead, throws itself out or splits several feet away either in a forward or aft direction. If it is therefore desirable to bulkhead a resilient hull, this must be of a flexible nature.

After considerable experiments had been carried out a suitable type was used with every success, its nature being of double diagonal planking, in between and round the edges of which was fitted heavy canvas, marine glued and through-fastened. Where this is to be fastened to the hull an inside timber or hoop is laid round the stringers and through-fastened to the stringers; a padding piece is laid between the hoop, stringer, and the skin, also through-fastened, forming complete register round the hull. The bulkhead, complete with canvas collar, is then laid in the hull, the canvas necking assuming a "Z" shape in section on either side of the bulkhead. The bulkhead is then secured by floating cross members which allow the whole of the bulkhead to float in any direction or the hull to move in any direction round the bulkhead to an extent of about 2 ins. on any diameter. The arrangements

of experimenting tests were carried out in an ordinary barrel, by stand pipe and water pressure, being fitted between the sound end of the barrel and the bulkhead, the other end of the barrel being removed.

Another Supermarine feature is the question of the step. All hulls constructed and designed by the Supermarine Company have built-on fore and aft steps of a watertight nature. Each step is divided into two complete halves on the port and starboard side of the main keel proper, and each half is again divided into four separate watertight compartments. On these boats the steps continue or protrude a considerable distance forward of the hull proper. This protruding portion of the lower step is divided up by a collision bulkhead forming a fore peak, which in case of ramming any floating object carries away the forward part of the step which is always out of water, and the chances of damaging the hull proper or the flotation part of the step are practically *nil*. The rear steps are also divided into watertight compartments, the main object being in case of the step being holed or severely damaged the chances of failure are 8 to 1, and anyway the design allows for the steps to be filled with water and then not to endanger the buoyancy of the boat to any extent which would be dangerous.

A further point is in case of bad damage the main circular part of the hull is not scrapped. The boat can be put into dry dock and have a complete new step built on it, which is a matter of great importance, both in war-time and from a commercial point of view. The following facts may be of interest :—Supermarine standard four-seater hull, 31 ft. in length, takes three men and two boys on an average 5½ weeks to build, working on a 47-hour week. This type of hull, however, can be manufactured, if it is a question of saving time, in considerably less periods ; for example, for the aircraft for the Martlesham amphibian trials the Supermarine Company designed and completed a flying boat in all respects in 10 weeks from the time when the first drawing was commenced to the time the aircraft was in the air, the actual hull building time being 4½ weeks. This hull was considerably bigger than the standard type of Supermarine construction.

It is worthy to note that during the firm's trials at Southampton this aircraft landed in a ploughed field, with furrows of about 15 ins., which not only pulled the amphibian up in a very short distance, but owing to the heaviness of the ground, threw the boat forward on its nose, leaving the section of the hull on the earth for a distance of about 15 yards. The boat was dropped on its tail, which also speaks of the rigidity of tail construction, to put up with such treatment, and was flown off and landed on Eastleigh Aerodrome. No damage of any kind, with the exception of scratched varnish, was experienced, and later during the trials the aircraft was often tripped in this manner by the pilot for turning purposes. Battens had been fitted in the fore part of the boat as rubbing strakes.

AIR MINISTRY NOTICES

List of Notices Operative and Cancelled

1. The following Notices to Airmen are still operative :—

Year 1920.—Nos. 2, 4, 8, 14, 17, 21, 22, 33, 35, 36, 38, 49, 51, 52, 70, 72, 73, 77, 78, 84, 85, 91, 92, 94, 95, 96, 98, 99, 101, 102, 104, 105, 108, 111, 113, 114, 115, 117, 118, 119, 120, 121, 122, 123, 125, 126, 127, 128, 129, 130, 131, 133, 134, 136, 138, 139, 140, 141.

Year 1921.—Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32.

2. The following Notices are not now operative, and are cancelled :—

Year 1920.—Nos. 1, 3, 5, 6, 7, 9, 10, 11, 12, 13, 15, 16, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 74, 75, 76, 79, 80, 81, 82, 83, 86, 87, 89, 93, 97, 71, 88, 90, 100, 103, 106, 107, 109, 110, 112, 116, 124, 132, 135, 137.

Castle Bromwich Aerodrome : Landing Area and Marking

1. A *white* dotted line running approximately from East to West has been constructed across Castle Bromwich aerodrome (52° 31′ 0″ N., 1° 47′ 30″ W.), dividing it into two parts, and a *white* landing circle, 60 ft. in diameter, has been placed in the portion of the aerodrome situated to the north of this line.

2. Aircraft should land only in the northern portion of the aerodrome, the southern half having been relinquished for the formation of playing-fields. Machines having landed in the northern portion can taxi across these playing-fields to the sheds at the southern extremity of the aerodrome.

(No. 29 of 1921.)

Summer Time, 1921 : British Isles, France and Portugal

1. *British Isles.*—Summer Time (*i.e.* an advance of one hour on G.M.T.) came into operation on Sunday, April 3, at 0200 hours. Normal time will be resumed on October 3, 1921.

2. *France.*—Summer Time (*i.e.* an advance of one hour on G.M.T.) was brought into force in France on the night of March 14/15, 1921. Normal time will be resumed on October 25, 1921.

3. *Portugal.*—Summer Time (*i.e.* an advance of one hour on G.M.T.) was brought into force in Portugal on the night of February 28/March 1, 1921.

(No. 31 of 1921.)

France : Flying of Captive Balloons on the St. Inglevert-Paris Route

1. In order to assist airmen flying above cloud or fog, the Service de la Navigation Aérienne is about to experiment in marking the French part of the Paris-London air line by means of captive balloons.

In foggy weather, or in case of cloud below 800 metres (2,625 ft.), a balloon will be sent up at each of the following points :—

Paris, on the N.E. glacis of Fort Aubervilliers.
Beauvais, on the Franc-Marché square.
Boulogne-sur-Mer, on the battery of the Tour de l'Ordre (Casino).

The balloon will be put up during the day, between sunrise and half an hour after sunset, and will be kept above the low cloud, generally at an altitude of 1,500 metres (4,920 ft.) and never above 2,000 metres (6,560 ft.). The cable will bear a red streamer every 300 metres (984 ft.) and the balloon will bear signals.

The balloon will be hauled down :—

(1.) When the cloud base exceeds 800 metres (2,625 ft.) or the sky is less than a half covered.

(2.) To attach signals.

(3.) When the velocity of the wind exceeds 20 metres/sec. (45 miles per hour) at the *Boulogne* and *Aubervilliers* stations, and 12 metres/sec. (27 miles per hour) in the case of the *Beauvais* station.

2. *Method of Use.*—Pilots navigating by dead reckoning above fog or low cloud will use the balloon as a landmark to find their position and correct their track.

In addition the balloon will carry a signal showing the altitude of the cloud base at the point at which the balloon is sent up. The absence of such a signal will mean that it has been torn away by the wind.

The following system of signals will be employed :—

Signal (suspended from the balloon).	Meaning.
A ball	Mist or thick fog at ground level or below 50 metres (164 ft.). Landing impossible.
A streamer	The base of the cloud or fog is between 50 (164 ft.) and 100 metres (328 ft.) above the highest surrounding obstructions. Landing possible, but dangerous.
Two streamers	Cloud base between 100 (328 ft.) and 200 metres (656 ft.) above the highest neighbouring obstructions.
Three streamers	Cloud base between 200 (656 ft.) and 300 metres (984 ft.).
Four streamers	Cloud base between 300 (984 ft.) and 400 metres (1,312 ft.).
A ball and a streamer	Cloud base between 400 (1,312 ft.) and 500 metres (1,640 ft.).

Ascents will take place for a period of one month from March 25. Notification of the cessation of the test will be given in a Notice to Airmen.

N.B.—Pilots flying below the clouds will easily avoid running into the cables at *Boulogne* and *Beavais*, as the winches are situated in the town. At *Aubervilliers* the approach to the fort is marked to the south by the buildings of Paris and to the north by the railway running east and west.

(No. 32 of 1921.)

SIDE-WINDS

SERVICE readers of FLIGHT who are considering the question of kit will find the announcement of Burch's well worth special attention. Having been fortunate in buying, on favourable terms, considerable quantities of R.A.F. standard cloths they are able to offer a full R.A.F. outfit for £71, representing a saving of at least £30 over other makers' charges. The firm has had an extensive experience in the making of uniforms, so that they can guarantee that the garments turned out by them are correct as regards fit and style. They publish a list showing their charges for each item in the kit, and any officer or prospective officer can obtain a copy of this useful list by writing to the firm at 401, Strand, W.C. 2.

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As evidence of reviving activity in the motor and kindred trades, and also of the steadily growing prosperity of the progressive firm of Barimar, Ltd., it is interesting to record that they are about to move to larger and more commodious premises. Messrs. Barimar, we understand, in order to facilitate the "speeding-up" process, which is such a pronounced feature of their organisation, are consolidating the administrative and works establishments under one roof. The re-organisation, of course, brings their well-known West End offices and showrooms—10, Poland Street—and also the Holborn works, into the market, affording a chance for some firm on the look-out for very central and convenient premises.

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AT last the General Electric Co. has entered into possession of its new headquarters, Magnet House, Kingsway, London, W.C. 2, where is now located the head office, sales department, etc. The new telephone call is 7050 Regent, and as there are 50 lines, no difficulty should be experienced in getting on. Until further notice the showrooms of the company will remain at 67, Queen Victoria Street, E.C. 4.

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THERE is every likelihood, we are glad to learn, that the rush for seats on the air lines to the Continent experienced at Easter will continue throughout the summer.

Since the reduction in fares to Paris and Brussels the number of passengers has been trebled and the re-opening of the British services has attracted more British businessmen to use the services. It is found that, not only from London to Paris, but also from Paris to London, the British machines are far more popular.

At the Lep Aerial Travel Bureau, the headquarters of the Air Traveller, we were informed the other day that within a month there will be three or four services daily to and from Paris, probably at 9.30, 11.00, 12.30, and 4.30. These times will allow a business-man to travel to Paris and back in a day, having time there to do three or four hours' business.

Arrangements are already in hand for increased services to be run at Whitsun, and for the Grand Prix, for which event special aerial excursions, inclusive of hotel accommodation, motor-cars to and from the race-course, and admission to the Grand Stand, are being arranged.

Commencing on April 4, a Dutch Company was to start running a daily service from London to Rotterdam and Amsterdam, using Dutch-built aircraft with British pilots, and British engines, the fares being £10 10*s.* single and £18 18*s.* return. These machines leave London at 10 a.m., the car conveying passengers to the aerodrome leaving the Lep Aerial office an hour before.

We learn that the old-established steel tube making concern, The Oriental Tube Co., Ltd., West Bromwich, Birmingham, has recently been acquired by the General Electric Co., Ltd., 67, Queen Victoria Street, London, E.C.

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"ORIENTAL" tubes are known throughout the world for their high standard of excellence, and this reputation will be fully maintained under new control. The Oriental Tube Co. has gradually developed into one of the largest firms of steel tube manufacturers in Great Britain. Much of this success is due to the untiring energy and business acumen of the retiring managing director, Mr. E. H. Dowler, who for upwards of twenty-two years has held that responsible position. In vacating the directorship, Mr. Dowler carries with him the good wishes of all who have been associated with him during the long years of business connection.

* * * *

U.S.A. National Balloon Race

MAY 21 has been fixed by the Aero Club of America for the National Balloon Race, to start from Birmingham (Alabama).

A "Mass" Parachute Display

A SACRAMENTO message states that at Mather Aerodrome five men from an aeroplane 2,000 ft. up took the air by parachute, in each case two parachutes being used, one strapped to the breast and the other to the back, so arranged that the second one functioned later than the first after the jump. All are reported to have landed safely.

Mdlle. Bolland Crosses the Andes

FROM a *Daily Mail* report Mdlle. Bolland, the French aviatress, on April 1, left Mendoza, Argentina, at 7.30, and flew over the Andes Mountains, arriving at Santiago in Chili, just three hours later.

This is the second time Mdlle. Bolland has flown over the Andes.

The distance Mdlle. Bolland covered was about 112 miles. There are heights of more than 20,000 ft. in the neighbourhood of the point at which she crossed the range.

We are just wondering whether the journey was a "non-stop" one, with strong headwinds, or whether a halt was made *en route*, and, if the latter, where.

A Crash at Biggin Hill

A REGRETTABLE occurrence took place on March 31 at Biggin Hill Aerodrome, Kent, resulting in two deaths. Flying Officer Hemsley left the aerodrome about 4 p.m. with a "D.H. 4" machine, on a navigation test, accompanied by Mr. E. Fenton-Terry, a civil assistant. When the machine had reached an altitude of 600 ft. the engine almost stopped, and the pilot was seen to be making a nose dive in order to restart it. Succeeding in this, Lieut. Hemsley again rose, but he had not gone far when the engine "cut out." The pilot again made a nose dive, and came heavily to earth at the foot of the valley at Biggin Hill. Lieut. Hemsley was apparently instantly killed, Mr. Fenton-Terry being so seriously injured that he died shortly before 8 o'clock in the evening.

Mishaps at Orleans and in Bolivia

M. RUX, the French airman, who served with distinction in the infantry during the War, was killed at Orleans aerodrome, on April 4, while attempting to make a parachute descent from a height of 500 ft. The parachute failed to open.

At La Pax (Bolivia), on April 3, a Blériot battle two-seater biplane came down upon a crowd. It is reported that the pilot—named Bourdon—one passenger, and eight spectators were killed, and five injured.

Dutchman Designs Airship

FROM Holland it is reported that a Dutchman, Herr A. Boerner, has designed a new type of airship, for which it is claimed that it is not subject to loss of gas, while the danger of fire has been eliminated without resorting to the use of helium gas, ordinary hydrogen being used. Briefly, it appears that the principle employed consists in interposing between the outer air and the hydrogen in the ballonets a layer of nitrogen. In addition to the fire-resisting qualities resulting from the nitrogen layer, it is claimed that this gas reduces the loss of hydrogen due to diffusion to a very small quantity. As the airship is of very large dimensions—there is talk of a length of 950 ft. and 300 passengers—it will probably be a little while yet before the craft is built. In the meantime, one would imagine that the principle could be tried out on a smaller scale with advantage.

FLIGHT

The Aircraft Engineer and Airships

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